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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,696	11/14/2003	Nurith Kurn	492692000102	4339

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EXAMINER	
MUMMERT, STEPHANIE KANE	

ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/713,696	KURN, NURITH	
	Examiner	Art Unit	
	Stephanie K. Mummert, Ph.D.	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13,22-24,48 and 49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,22-24,48 and 49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *111403,12004,33005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The preliminary amendment filed November 14, 2003 canceling claims 14-21 and 25-47 is acknowledged and has been entered. Claims 1-13, 22-24 and 48-49 are pending and will be examined.

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on November 14, 2003; January 20, 2004 and March 30, 2005 were filed in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-6, 8-9, 11, 12 and 22-23 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 and 10 of U.S. Patent

No. 6,251,639; issued June 26, 2001. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations of the claims of the instant application share the same scope of the invention as the previously patented claims.

For example, while claims 1 and 2 of the '639 patent and instant application differ through the inclusion of the term 'optionally hybridizing' a termination polynucleotide, the limitation of optional hybridization of the termination polynucleotide is incorporated through claims 6 and 7 of the copending application. Furthermore, claims 1 and 2 of the '639 patent recite 'hybridizing a single stranded DNA template' while claim 1 of the copending application recites 'wherein said complex comprises a composite primer hybridized to a single stranded DNA template'. While the claims do not share identical claim language, the scope of the claims between the '639 patent and the instant application are the same.

4. Claims 1-7, 9-10, 12-13, 23-24 and 48-49 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10, 17-18 and 42-43 of U.S. Patent No. 6,692,918. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations of the claims of the instant application share the same scope of the invention as the previously patented claims.

The language of the claims are not identical, but the differences between the claims are the order in which components or steps are recited. For example, claim 1 of the instant application and the claim 2 of the '918 patent recite the same scope of the claimed invention, however, claim 1 of the copending application recites steps in a different order and in slightly different language than that recited for claim 2 of the '918 patent.

Claim 1 of the instant application recites:

A method for amplifying a polynucleotide sequence complementary to a target polynucleotide sequence comprising: a) hybridizing a polynucleotide comprising a termination polynucleotide sequence to a DNA template-composite primer complex, wherein said complex comprises a composite primer hybridized to a single-stranded DNA template comprising the target sequence, said composite primer comprising an RNA portion and a 3' DNA portion, whereby said polynucleotide comprising a termination polynucleotide sequence is hybridized to a region of the template which is 5' with respect to hybridization of the composite primer to the template;

b) extending the composite primer in the DNA template-composite primer complex of step (a) with DNA polymerase;

c) cleaving the RNA portion of the annealed composite primer with an enzyme that cleaves RNA from an RNA/DNA hybrid such that another composite primer hybridizes to the template and repeats primer extension by strand displacement, whereby multiple copies of the complementary sequence of the target sequence are produced.

As a comparison, the method of claim 2 of '918 patent recites:

A method for amplifying a polynucleotide sequence complementary to a target polynucleotide sequence comprising a) extending a composite primer in a complex comprising i) a DNA template strand comprising a target sequence; ii) the composite primer, said composite primer comprising an RNA portion and a 3' DNA portion, wherein the composite primer is hybridized to the DNA template strand; and iii) a polynucleotide comprising a termination polynucleotide sequence, wherein the polynucleotide comprising a termination polynucleotide sequence is hybridized to a region of the template which is 5' with respect to hybridization of the composite primer to the template; b) cleaving the RNA portion of the annealed composite primer with an enzyme that cleaves RNA from an RNA/DNA hybrid such that another composite primer hybridizes to the template and repeats primer extension by strand displacement, whereby multiple copies of the complementary sequence of the target sequence are produced.

As evidenced by the side-by-side comparison between claim 1 of the instant application and claim 2 of the '918 patent, the components of the method are the same, including the composite primer, the termination polynucleotide and the DNA template and the steps of the method are the same, these components and steps are merely recited in a different order or using slightly different language in the two separate sets of claims.

The same situation as described above can be seen between each of the rejected claims of the instant application and the claims recited above within the '918 patent. Despite differences

in the manner in which the limitations are recited, the methods are the same between the instant application and the '918 patent, so therefore these claims are not patentably distinct.

6. Claims 2, 4, 8, 11 and 22 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 6-8 and 10-11 of U.S. Patent No. 6,858,413; issued February 2005 in view of Soderlund et al. (US Patent 6,013,431; January 11, 2000) and Kurn et al. (US Patent 6,251,639; issued June 26, 2001). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '413 patent represent a more narrow scope of the broader claims of the instant application. The method of claim 1 of the '413 patent is recited:

> A method of generating multiple copies of a nucleic acid sequence of interest, said method comprising the steps of a) hybridizing a composite primer to a target polynucleotide, wherein the composite primer comprises an RNA portion and a 3' DNA portion, the 3' DNA portion comprising a 3' most nucleotide, such that the 3' most nucleotide of the 3' DNA portion hybridizes from 1 to about 10 nucleotides from the sequence of interest; b) extending the composite primer with DNA polymerase under conditions that permit primer extension, whereby a primer extension product is produced; and c) cleaving the RNA portion of the primer extension product of b) with an enzyme that cleaves RNA from an RNA/DNA hybrid such that the cleaved primer extension product dissociates from the target polynucleotide,
>
> wherein the primer extension product is of a size that when the RNA is cleaved the cleaved primer extension product dissociates from the target polynucleotide under essentially the same conditions as those for primer extension, whereby multiple copies of the sequence of interest are produced.

The claims of the instant application differ from the claims of the '413 patent in that the claims of the instant application disclose the dissociation of the primer extension products using strand displacement, while the claims of the '413 patent disclose dissociation following cleavage of the RNA portion of the composite primer. Noting the teaching in the disclosure of the '413 patent, that "as illustrated in Figure 2, the 3' DNA portion of the newly hybridized primer could

also displace the 5' DNA portion of the cleaved primer extension product to initiate extension of the newly hybridized primer along the template strand by polymerase. The extended portion of the cleaved primer dissociates from the template." (col. 66, lines 42-47 and Figure 2). Considering this embodiment of the invention claimed in the '413 patent, it would be obvious for dissociation of the extended primer to occur through strand displacement, as claimed in the instant application.

The claims of the instant application also differ from the claims of the '413 patent in that the instant application does not recite that the 3' most nucleotide of the 3' DNA portion of the primer hybridizes from about 1 to about 10 nucleotides from the sequence of interest.

Hybridizing a primer near a sequence of interest is well known in the art in order to aid in the identification of sequence variants. For example, Soderlund teaches the hybridization of the 3' most nucleotide of the 3' DNA portion of a primer for identifying single nucleotide variations (col. 3-9, Figures 1-3). Soderlund also teaches many of the methodologies that accompany the amplification and detection of nucleotide variations, including the use of labels, probes and solid supports (col. 3-17).

Considering the teachings of Soderlund, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of the '413 patent to include the step of designing the composite DNA-RNA primer so that the 3' most nucleotide of the 3' DNA portion of the primer would hybridize 1 to 10 nucleotides from the sequence of interest, in order to achieve the benefit of providing an effective means of detecting, identifying and confirming nucleotide sequence variations.

Conclusion

Claims 1-13, 22-24 and 48-49 are free of the prior art. The closest prior art, Cleuziat (US Patent 5,824,517; October 1998). While Cleuziat et al disclose a method of amplification that includes an RNA-DNA composite primer and an RNAse and also disclose that the method may be applied to RNA or DNA target sequences, the method does not teach or suggest the binding and extension by strand displacement of a second composite primer, whereby multiple copies of the target sequence are produced.

Claims 1-13, 22-24 and 48-49 stand rejected. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephanie K. Mummert, Ph.D. whose telephone number is 571-272-8503. The examiner can normally be reached on M-F, 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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